

National Source Water Contamination Prevention Strategy

Fifth Draft for Discussion

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PREFACE

Preventing drinking water source contamination depends on the awareness, participation, and actions of federal agencies, state agencies, tribal officials, local governments, interest groups, individual citizens and the business community. This source water contamination prevention strategy is based on the premise that no single entity can effectively be the driver of drinking water source protection efforts in every case. Taking it a step at a time, this strategy lays out a broad vision for source water contamination prevention, and then focuses on the priority actions within EPA's Water Program.

The first phase of this strategy is reflective of what *EPA's Water Program* can do to further source water contamination prevention nationwide. It does not attempt to define what others can do, but rather provides a blueprint for the EPA Water Program's efforts. As we gathered input from the public during development of this strategy, a common theme emerged: EPA needs to create stronger linkages between the Clean Water Act and Safe Drinking Water Act Programs, as well as between other national pollution prevention programs such as those under the Resource Recovery Act and the Underground Injection Control Program. This strategy in part addresses specific steps of how our national offices will do our part to tighten this linkage where it is weak.

It is the intent of the Water Program to lower the risks to public health by preventing contamination of drinking water resources. Source water protection should be a standard part of providing safe drinking water to the public. All the EPA Water Programs will actively support the protection of public drinking water sources by controlling pollution so that the contaminant levels entering a drinking water intake are as low as possible. If not eliminated, contaminant levels should be at least as low as, or lower than, the applicable drinking water safety standards.

Building consensus requires a long and sustained effort. This strategy is the start of our efforts to foster consensus among the variety of interests that can play a role in source water protection. EPA's Water Program is committed to working with other partners interested in laying out their role in promoting source water contamination prevention. We look forward to the continued partnership.

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INTRODUCTION

Over 200 million Americans receive drinking water from approximately 170,000 public water supplies. Nonetheless, drinking water safety cannot be taken for granted. Drinking water that is not adequately treated or travels through a faulty distribution system can endanger the health of a community. Yet it starts at the source: a community is automatically at higher risk if it relies on a source that is contaminated with micro-pathogens (organisms that can cause disease) or other harmful compounds. Improperly disposed chemicals, animal wastes, pesticides, human wastes, wastes injected deep underground, and naturally occurring minerals can all contaminate drinking water sources.

In 1999, as part of the 25th Anniversary of the Safe Drinking Water Act (SDWA) celebration, the Environmental Protection Agency (EPA) hosted an open dialogue to discuss the future of safe drinking water at the tap. During this Futures Forum dialogue, concern for the quality and quantity of the aquifers (natural underground layers of stone, sand or gravel that contain water), rivers and lakes serving as our nation's water supplies was high on everyone's agenda. There was a recognition that the national trends of increasing population, urbanization and development are adding pressures to the water supplier's job of providing safe drinking water at the tap. Given the increased pressures, how can the many people whose daily decisions and activities in the community affect water quality work together to prevent contamination of our drinking water sources?

The Importance of Source Water Contamination Prevention

Source water contamination prevention is a common sense approach to safeguarding public health by taking action to protect each source of drinking water from contamination by chemical and microbiological contaminants. Preventative actions are successful when they significantly lower the risk of contaminants of concern entering waters that serve as public drinking water supplies, or that are likely to be used as a drinking water supply in the future. In many cases, contamination prevention is the primary safeguard to public health, particularly for water systems with less sophisticated treatment technologies.

A program to prevent drinking water contamination is important for three reasons: It makes good public health sense, good economic sense, and good environmental sense.

Public Health. When waterborne diseases occur due to contaminated drinking water, the burden of solving the problem falls on the community. Source water contamination prevention is the first barrier to the outbreak of waterborne illnesses: keeping contaminants out of the source water helps keep them out of the drinking water supply.

Economic Benefit. Drinking water contamination is not cheap. Not only can wages be lost and medical costs incurred, but alternative water supplies may be required in the short run. Over the long-term, treatment systems may have to be expanded, or a new water sources found, to meet new regulatory requirements or to address new contaminant threats. Source water contamination

prevention can keep such costs in check. An EPA analysis of a variety of communities showed that on average, dealing with contamination of their ground water supply may be 30 to 40 times more costly than to prevent contamination in the first place. As the old adage goes, “an ounce of prevention is worth a pound of cure.”

Environmental Protection. Taking actions to protect drinking water sources can also protect the water resource for aquatic ecosystems. Development pressures, polluted runoff from agricultural, commercial, and industrial sites, septic system leaching, and aging wastewater infrastructure are some of the threats to water quality that affect not just drinking water quality but aquatic habitat. Ground water also affects the health of aquatic ecosystems: in many areas of the country, depleted aquifers are causing reduced ground water contributions to surface water flow to the point that habitats are threatened. In other regions, polluted ground water can significantly degrade quality of connected surface waters.

Successes and Challenges to Implementing Source Water Contamination Prevention

We’ve come along way towards preventing contamination of the nations drinking water supplies.

- Today, 49 states, Puerto Rico and Guam have EPA-approved Wellhead Protection Programs to help guide local drinking water protection efforts for ground water supplies. As of 1999, states report that over 3,000 communities are practicing wellhead protection, and others are partnering in local watershed protection initiatives to protect drinking water. Over 90 tribally-operated water systems out of 730 across the country have started wellhead protection efforts.
- Of the 23% of rivers and streams assessed in 1998, 38 states report that 87% of those used for drinking water are of good quality. Of the 43% of lakes and reservoirs assessed, 38 states report that 82% of those used for drinking water are of good quality.
- Since 1974, EPA has designated 71 Sole Source Aquifers, resulting in the review of an average of 200 federally-funded projects per year to ensure that they will not pollute these aquifers.
- Underground Injection Control programs nationwide regulate more than 400,000 injection wells and up to 89 percent of all hazardous waste that is land-disposed in the United States.
- Eleven states have comprehensive ground water protection programs to coordinate protection of ground water resources within the state and all fifty states report some degree of coordination between state programs to protect ground water resources.

- Forty-nine states, Puerto Rico, the District of Columbia, and two tribes have approved source water assessment programs. Over 90 tribally owned water systems are on their way to completing assessments.

However, there is much progress to be made. More than 84 percent of all drinking water systems report having at least one potential source of contamination within 2 miles of their water intake or well. According to the 1997 Wellhead Biennial Report only 10 percent of water suppliers have protection measures in place, ranging from local land use ordinances to public education efforts. State water quality programs claim that drinking water uses are a priority, but only 38 states report on drinking water uses. What are the challenges to source water contamination prevention?

A significant and overarching challenge is coordination. Often, the necessary diversity of jurisdictional and social partnerships for effective protection creates difficult obstacles at national, regional, state and local levels.

For example, at the local level, the utility or township controls the output of the treatment facility. However, the utility or single township does not typically control the quality of its source of drinking water. This is why partnerships across jurisdictional, governmental, and ownership lines are crucial to any community wishing to prevent contamination of source water.

To take another example, states and tribes are in the first full year of completing source water assessments, while at the same time continuing to implement Underground Injection Control (UIC) and Wellhead Protection Programs. States and tribes are also implementing prevention programs and initiatives under the Clean Water Act to identify high priority watersheds and impaired waters, as well as to restore water quality for the nation's most impaired water bodies. Other parts of state and tribal programs are working to shut down leaky underground fuel storage tanks and develop state pest management plan programs. These are only a few of the parts of a state or tribal government that play a part in protecting drinking water sources. How can all of these pieces better work to prevent contamination of drinking water supplies, not just at the state and tribal levels, but also federally and locally?

Why Are We Writing this Strategy?

To avoid fragmentation, it is time to develop a strategic plan for source water contamination prevention that defines common goals for implementation that all partners can use. This strategy takes a first step to identify some tangible objectives to transition from source water assessments to contamination prevention, and begins the dialogue to:

- *Establish a national vision* to guide future contamination prevention activities and allocation of resources to achieve the greatest level of public health protection;
- *Foster a consensus on a strategic approach* to set national program priorities by identifying key objectives and actions;
- *Develop a common understanding and establish national measures* for source water contamination prevention in order to track progress across the nation as to how successful local initiatives are at lowering the risks of source water contamination;

- *Clarify the roles and responsibilities* of EPA to further the source water contamination prevention vision; and
- *Identify emerging issues.* Since 1996, issues have come to the forefront that the present SDWA statutes and prevention programs do not deal with, such as addressing privately-owned wells and linkages between water quantity and quality.

Scope of this Strategy

Given the time frame and the number of players that are necessary to make source water contamination prevention a reality, this strategy lays out a national vision and objectives, and defines the specific actions that EPA's Water Program proposes to take over the next five years. The Strategy is presented in four parts:

- I *Vision and Building Blocks:* Given no resource or time constraints, what is the long term goal of a national effort to achieve source water contamination prevention?
- II *Strategic Approach:* How do we move closer to the vision, based on the realities of time, resources, and institutional barriers? The strategic approach attempts to identify some key objectives that, if addressed, can help to nationally strengthen capacity across all of the partnership levels to move from assessments to protecting drinking water sources.
- III *Measuring Progress:* If we have a national vision, how can we show national progress? This strategy begins to lay out the possibilities for what are the measures that EPA could use to show national progress of moving from assessments to actual contamination prevention, and options for how to collect and manage data.
- IV *Emerging Issues:* If we are preparing for the future, what emerging issues do we need to start exploring for incorporation into a longer term comprehensive source water protection?

PART I: VISION AND BUILDING BLOCKS

The development of state and tribal source water assessment approaches has been an evolutionary process. The first step was to reach a common understanding among states, tribes, stakeholders and other federal agencies that assessing the sources of all public water supplies is an important driver of efforts to protect drinking water resources. As states have developed their approaches to completing source water assessments and have heard from Citizen Advisory Committees, and EPA has heard from stakeholders, consensus is building that there needs to be a clear national plan beyond source water assessments that provides a framework for transitioning to source water protection. A proposed long-term vision for source water contamination prevention is that:

For every public water supply, all interested stakeholders will be involved in identifying priorities and taking actions that significantly lower the risk of contaminants of concern entering drinking water resources.

Building Blocks for the Vision: History and Trends

This vision for source water contamination prevention builds upon 25 years of efforts to address the protection of drinking water aquifers, lakes, reservoirs and rivers. Looking at a timeline of programs, there are a series of federal stepping stones that include not only initiatives with a water focus but the statutes that focus on pollution prevention and resource conservation (Appendix C). These programs, in tandem with a variety of other federal, state, tribal and local initiatives, have resulted in progress to protect drinking water sources. However, there are cornerstones to source water that are grounded in two key statutes: the Safe Drinking Water Act and the Clean Water Act.

Underground Injection Control - 1974

The Underground Injection Control Program, mandated by the 1974 SDWA, was one of the first SDWA provisions created specifically to protect underground sources of drinking water. This program regulates wells that are used by various municipal, agricultural, commercial and industrial entities to inject fluids underground for the purpose of disposal, hydrocarbon production and storage, or mineral recovery. Fluids may also be injected into underground wells to replenish depleted aquifers with surface water for later retrieval, and to prevent salt water intrusion into underground sources of drinking water. Shallow drainage systems which discharge contaminants above or directly into underground sources of drinking water are additional examples of waste injection practices regulated under this program. Today, 36 states and territories have primacy for UIC programs and EPA directly implements 17 programs. These programs regulate more than 400,000 injection wells (see Appendix C).

Sole Source Aquifer Protection - 1974

Another ground water protection effort established by SDWA is the sole source aquifer protection program. Congress included this provision in the 1974 SDWA, and has not modified it since. The program allows communities, individuals, and organizations to petition EPA for protection of an aquifer that is the “sole” or principal source of drinking water for the local population. A region is eligible for sole source aquifer status if more than 50 percent of the population in the defined area relies on the designated aquifer as its primary source of drinking

water. Once EPA designates a sole source aquifer through a public process, EPA has the authority to review federal financially-assisted projects that may potentially contaminate the aquifer. If the proposed project poses no threat, then the project continues as planned. However, if there is potential for contamination of the aquifer, EPA must work with the project leader and associated federal agency to recommend protective modifications. Examples of federally funded projects that EPA reviews because the activity may impact ground water quality include:

- transportation-related improvement and construction;
- infrastructure upgrades of public water supply systems and waste water facilities;
- agricultural projects which involve animal waste management concerns; and
- construction of multi-family housing, business centers, gasoline stations, and hospitals.

Since the first sole source aquifer designation in 1975, EPA has designated 70 aquifers in 25 states and territories (*see Figure from history and trends report*).

The Clean Water Act - 1977

SDWA programs are not the only means by which drinking water sources are protected from pollution. The Clean Water Act established a national framework for regulating the discharge of pollutants to waters of the U.S. Aggressive use of this Clean Water Act authority can reduce the contaminant loading that might otherwise have to be removed by drinking water treatment facilities to protect public health.

The Clean Water Act requires states and authorized Native American tribes to set water quality standards which consist of two parts: 1) states and tribes assign “designated uses” to each of the waterbodies in their jurisdiction, such as serving as public drinking water sources, providing fish and shellfish for safe human consumption, and allowing recreational activities like swimming; then, 2) states and tribes set water quality criteria (e.g., maximum pollutant concentrations) to support the designated uses.

If water quality criteria are exceeded for a waterbody, the state must list that waterbody as impaired and establish a “total maximum daily load” (TMDL) for the pollutant. The TMDL is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The TMDL is allocated among individual dischargers of the pollutant.

The Clean Water Act requires that states survey, assess and report on the degree to which their surface waters support designated uses. Some Native American tribes also report this information. Thirty-eight states, tribes or territories submitted data to EPA in 1998 that address the support of public drinking water use. According to that data, the majority of waterbodies designated as public water supplies are fully supporting that use (87 percent of assessed rivers and streams, and 82 percent of assessed lakes and reservoirs).

In the early 1990s, only a small percentage of rivers, streams, lakes, and reservoirs were assessed for drinking water use. In 1996, EPA published state guidelines for assessing the extent to which waterbodies are of sufficient quality to support their use as drinking water supplies. EPA modified these guidelines in 1998 to give states more flexibility. That additional flexibility has resulted in an increasing number of states performing drinking water use assessments under the Clean Water Act. The number of states that are reporting data on how they classify waterbodies for drinking water use, and on the sources of water contamination, is also increasing.

However, many challenges remain. In 1998, twelve states did not report on whether, or how, their water quality standards support drinking water use and many of the 38 states that reported water quality data did not explain how they classify waterbodies to support drinking water use, or on the sources of contamination affecting those waterbodies. The source water assessments that are required by SDWA to be completed no later than 2003 should help strengthen this reporting from the states.

Wellhead Protection - 1986

A third provision of SDWA aimed at preventing groundwater contamination is the Wellhead Protection Program. The 1986 SDWA Amendments required each state to establish a program to protect the land areas around water supply wells from contaminants that may enter the ground water and adversely affect human health.

EPA approves state wellhead protection programs and provides technical support to state and local governments to implement the programs. Working primarily with the assistance of EPA regional offices, the number of states obtaining federal approval for their wellhead protection programs has increased steadily since 1990. Today, 49 states, Puerto Rico, and two tribes have approved wellhead protection programs in place (see Figure 9 of WQ Trends document).

Every two years, EPA reports to Congress on the progress of wellhead protection implementation. Figure ## (8 in the Water quality trends document) shows the number of community water systems where one or more of the five steps of a local wellhead protection effort has taken place. The five steps are:

- 1) Getting started (this usually means that a community planning or work team has been established);
- 2) Delineation of the land area to be protected;
- 3) Identification of potential contaminant sources within the delineated area;
- 4) Implementation of a source water protection plan to adequately manage potential sources of contamination; and
- 5) Development of a contingency plan to protect the water source in case of an accidental spill of hazardous materials or some other emergency.

State Comprehensive Ground Water Protection Programs - 1991

In July 1991, EPA released a ground water protection strategy which encourages states to develop comprehensive ground water protection programs that establish state-wide priorities for prevention and remediation activities. In 1992, EPA published national guidance detailing the exact program a state would have to implement in order to be endorsed by EPA as being comprehensive, and in 1999 EPA published a Ground Water Report to Congress reporting on the progress of states to implement this comprehensive approach.

These voluntary programs encourage federal and state programs to set common priorities for protective and remedial actions and to coordinate all programs to achieve common ground water protection and remediation goals. Programs to protect current and reasonably expected future drinking water supplies include wellhead protection, hazardous and other waste management, pesticides, underground storage tanks, and wetlands programs. Today, eleven states have EPA-endorsed comprehensive ground water protection programs (see Figure 9 Trends Report).

Each state has made progress in comprehensive program development, but many states still have fragmented and incomplete programs. Current data show that localized contamination still exists

in every state from sources such as septic systems, underground storage tanks, animal feeding operations, agriculture and manufacturing industries.

Source Water Assessments - 1996

Building upon the Wellhead Protection Program, the 1996 SDWA Amendments mandates that states complete source water assessments for the 270,000 public water supplies in the United States. Each source water assessment will consist of a map of a source water protection area, an inventory of the significant potential contaminant sources in the area, and an analysis of how susceptible the source water is to contamination. The intent is that the information from assessments can help communities take actions to lower the risk of potential contaminants posing a problem to the drinking water resource. These assessments provide a tool for further contamination prevention efforts, and are not a complete preventative plan in and of themselves. States will make the results of each assessment available to the public. Also, EPA is working with tribally owned drinking water systems to complete source water assessments. Then, each state, tribe, public water system, and locality can decide what preventive actions to take based upon the findings.

Water Conservation Planning - 1996

As mandated by the 1996 Amendments, on August 6, 1998, EPA issued guidelines for water conservation plans for public water systems. States may require water systems to submit a water conservation plan consistent with the EPA or any other guidelines as a condition of receiving a loan under the Drinking Water State Revolving Fund (DWSRF). The guidelines contain step-by-step approaches and conservation measures that can be used by water system planners to develop and implement plans for water conservation. Strategic use of water conservation can help extend the value and life of infrastructure assets used in both water supply and wastewater treatment, while also extending the beneficial investment of public funds through the DWSRF and other programs.

Drinking Water State Revolving Fund - 1996

The DWSRF program was established by the SDWA Amendments of 1996. The program authorizes grants to states to capitalize revolving loan funds. States use funds to provide loan assistance to eligible public water systems for infrastructure improvements needed to continue to ensure safe drinking water. The program also emphasizes preventing drinking water contamination by allowing states to reserve a portion of their grants to fund activities that encourage enhanced water system management and source water protection.

Under SDWA §1452(g)(2), states may use up to 10 percent of their DWSRF allotment to administer or provide technical assistance through source water protection programs, excluding enforcement actions. Under SDWA §1452(k), states may use up to 15 percent of their capitalization grants to fund several types of source water protection activities. States may provide loans for acquiring land or conservation easements and to fund voluntary, incentive-based source water quality protection measures. States may also make expenditures under this set-aside for establishing and implementing wellhead protection programs. States were allowed to reserve funds from fiscal year 1997 grants to conduct activities related to the SDWA §1453 requirements to delineate and assess sources of drinking water.

Also, in 1996, EPA started emphasizing the availability of Clean Water State Revolving Funds (CWSRF) to address drinking water source quality issues. Nationally, the CWSRF has in excess of \$30 billion in assets and has issued \$26 billion in loans since 1988. The CWSRF currently is funding nearly \$3 billion worth of water quality projects annually. Clearly, the CWSRF can be a powerful financial resource for funding source water protection projects.

Clean Water Action Plan - 1998

Announced by President Clinton in 1998, the Clean Water Action Plan (CWAP) provides a focal point for federal agencies to develop strategies and build upon existing programs to address water quality problems in watersheds identified by states and tribes as most in need of attention. In order to attain the end goal of clean water, it is essential to use a *comprehensive watershed framework* that integrates public health and aquatic habitat agendas when managing water quality. All of the actions in the Action Plan are guided by the watershed framework principles. For example, the Forest Service's roadless initiative, the Department of Interior's abandoned mine clean up, or EPA's total maximum daily load rule reflect this comprehensive framework by setting restoration and protection priorities based on a combination of criteria including public health and aquatic ecosystem concerns.

Critical to implementing restoration and protection measures under this comprehensive approach is knowing the locations of the water bodies that supply drinking water to U.S. communities, and the potential threats to these sources. The responsibility for collecting this information lies with the state and participating tribal governments, who are working to complete source water assessments by 2003. Because the federal agencies see the value in having this information to strengthen their comprehensive watershed planning and evaluate risks to public health at the national, regional, and local levels, all of the CWAP federal partners and the U.S. Postal Service signed an agreement in support of drinking water source assessment and protection. The goals of the agreement were to encourage field offices to continue or begin partnering with states, tribes and local communities to complete these assessments or to protect local water supplies; and increase awareness and encourage field offices to use the results of the assessments when developing relevant watershed management plans.

How Do We Build on this Progress?

Recognizing the importance of preventing contamination of drinking water sources is nothing new, and the Safe Drinking Water Act and the Clean Water Act are not the only catalysts. There are a multitude of other federal statutes that protect drinking water sources (Appendix C). How do all of these federal programs fit together, and how do we go beyond the scope of any single statute to most effectively prevent source water contamination? More importantly, how do we build on these steps to reach our vision of every drinking water source water actively protected by its community?

PART II: STRATEGIC APPROACH

Key National Source Water Contamination Prevention Objectives

Since passage of the 1996 Amendments, there has been much public dialogue among federal agencies, states, local governments, communities, private businesses and citizens on what needs to happen to move from source water assessments to source water contamination prevention. This source water contamination prevention strategy proposes five objectives:

- 1. *Promoting Local Control***
- 2. *Building Institutional Capacity of States and Federal Agencies to Support Localities***
- 3. *Targeting Pollution Prevention to Priorities Identified in Source Water Areas***
- 4. *Fostering Public Involvement***
- 5. *Increasing Private Industry Awareness and Involvement***

Priority EPA Water Program Actions

This strategy focuses on EPA's Water Program and what actions the Water Program will take over the next five years to facilitate the transition from source water assessments to source water contamination prevention. This is not the total solution to source water contamination prevention, nor does it outline our ongoing support to states and tribes to complete source water assessments, which will continue to be a high priority until all source water assessments are available to the public. Other partners – state, local, and other federal programs, private businesses and citizen groups – need to identify what they can do to promote contamination prevention. It is only at that point that we will have a truly comprehensive source water strategy. Following release of the plan, EPA will further develop the specific nature of the actions listed and develop and execute work plans and budgets to implement them. Many other more decentralized efforts will also need to take place at the state and local levels depending upon the results of the source water assessments and other local factors.

EPA Action Areas for Objective One: Promoting Local Control

Water suppliers, local governments and other local stakeholders will ultimately determine the success of prevention actions. No other stakeholders have more of a vested interest in reducing the risk of contaminants entering drinking water sources than the people that drink the water. Water system staff have the technical knowledge and background to help local government officials present regulatory and non-regulatory initiatives to citizens. Community members, working with their local governments and supporting the local water supplier, can be key players in using local assessment information to provide a rational basis for prevention activities. Local governments, given the support of their citizens, can align municipal ordinances and internal operations to protect drinking water resources.

However, not all communities or water suppliers have the resources or wherewithal to identify and implement contamination prevention measures. Furthermore, not all state drinking water programs have the resources to provide field support to water suppliers to plan and implement source water contamination prevention plans. EPA can help facilitate the growth of local control

by taking action in two areas: 1) increasing in-the-field support and 2) providing clear national guidance on what constitutes adequate contamination prevention measures for a local water supply source and their economic and social benefits.

a) Increase in-the-field support

Currently EPA provides assistance to the National Rural Water Association (NRWA) to fund the work of wellhead protection technicians. Over 7,000 communities have received assistance from NRWA to develop local wellhead protection plans. EPA needs to continue to work with wellhead protection technicians to refine their wellhead protection circuit rider programs encompassing the larger sphere of source water contamination prevention, and coordinating with state source water protection programs.

However, there are 170,000 water supplies across the country. Also, water suppliers are not always the stakeholder that will drive source water contamination prevention actions at the local level. EPA will strengthen partnerships with other local rural community assistance providers and circuit riders such as the Public Health Extension Service's and the U.S. Department of Agriculture's (USDA's) extension services to offer different types of assistance to different sets of stakeholders that may have a role to play in protecting their local source waters. A wide mix of local assistance providers knowledgeable in source water issues will facilitate the local spread of knowledge about source water contamination prevention, and increase the chances that implementation of prevention measures will become a reality.

EPA will also explore the possibility of providing small grants directly to local stakeholders targeted to three areas: 1) building local organizational capacity, similar to the intent of the Watershed Assistance Grants; 2) providing seed money for actual implementation of local priority contamination prevention actions; and 3) supporting local water supplier efforts to increase outreach to the public about source water protection.

b) Provide national guidance

There are a wide array of best management practices (BMPs) and tools available for different situations. The challenge is to decide which tools are appropriate for a given situation. In the coming year, EPA will develop a guidance on which BMPs are appropriate for different situations. EPA will provide training to water suppliers on how to determine which management practices to implement. Furthermore, EPA will invest resources on an economic analysis of source water contamination prevention for use at the local level.

***EPA Action Areas for Objective Two:
Building Institutional Capacity of States and Federal Agencies to Support Localities***

The institutional arrangements that can best support the management of potential contaminant sources will depend on the mix of local government jurisdictions and program jurisdictions that pertain to those sources. The more complex or complicated the contamination risks, the greater the need for a driver to manage the effort. Yet the institutional structures from the federal

statutes to state and local programs are often fragmented. This makes implementing an effective source water protection plan more difficult, especially when there are potential contaminant sources of concern that fall under different regulatory frameworks.

For several years, EPA's Water Program has been working with states to adopt comprehensive resource-based approaches, such as watershed, basin-wide and comprehensive ground water protection approaches that encourage intensive coordination between the different state programs. The source water assessment programs have been a test of the success of these approaches, because the data for source water assessments is often located in many different offices. The state source water advisory committee meetings often included a diverse contingency of state programs. EPA, states, tribes and local communities need to continue building on the institutional ties (e.g., between health, environment, ground water, underground injection control (UIC, agriculture and forestry departments) that were strengthened during development and implementation of the source water assessment programs, and weave a tapestry that will prevent contamination of the local drinking water sources.

a) Build stronger ties within environmental pollution control programs.

Source water protection touches on virtually every pollution control program within a state or tribe: underground storage tank management, underground injection control, superfund, land fill management, brownfield redevelopment, agricultural runoff management, oil spill management, transportation planning --- the list is expansive.

Starting within the Safe Drinking Water Act programs, EPA will work to better align the UIC Program's main activities—inventorying, permitting, inspection and enforcement into a comprehensive source water protection approach. UIC and source water program managers can use the results of source water assessments, sole source aquifer reviews, UIC inspection data, reports from operators, or other available information to identify UIC wells that threaten public water supplies and prioritize compliance efforts.

b) Strengthen the effectiveness of clean water quality programs to protect drinking water sources. EPA's Water Program will begin to establish cross-program policies and protocols to ensure that all relevant clean water policy and guidance which go forward re-enforce cross-program goals for source water protection. This issue is complex because it cannot be solved at any single level in government. It takes partnership, coordination, and in some cases, restructuring at the federal, state and local levels. However, one important overarching place for this to happen is in the national policies. In the past years, the national Water Program has begun to remedy the disjointed approach, with revisions to the water quality standards, National Pollutant Discharge Elimination System (NPDES), TMDL, monitoring and assessment programs. However, there are still implementation challenges, as indicated by the lack of reporting on source water quality by state water quality programs. The source water assessments should help bridge this gap.

EPA will also work with the Associations of State Drinking Water Administrators (ASDWA) and the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA), as

well as the Environmental Council of the States (ECOS) and the Association of State Health Officials (ASTHO), to promote cross-program goal setting at the state level.

c) Build partnerships with federal land management agencies and facilities to address source water protection policies on federally controlled lands and facilities, as well .

EPA will continue working with other federal agencies to further the goals of the 1998 Federal Interagency Source Water Agreement to encourage federal field and regional offices to use the results of state and tribal drinking water source assessments when developing relevant natural resource, technical assistance, facility management plans and water resource plans. State and tribal drinking water source assessments, when completed, will provide additional input for water resource protection efforts of federal agencies and enable such agencies to direct education, research, remediation, and protection programs to highest priority source waters. Additionally, state and tribal information on source water quality will help guide federal agency decisions regarding placement and construction of new facilities.

***EPA Action Areas for Objective 3:
Targeting Prevention to Protect Drinking Water Supplies***

Source water assessments define geographic areas that supply water to a drinking water well or surface water intake. Within these areas, potential contaminant sources are identified, with the intent that the data will help inform decisions necessary to lower the susceptibility of the water resource to contamination. EPA and other federal programs regulate some of the activities that can increase the susceptibility of source waters. There are other land use-based activities that can affect source water quality, such as forestry and agriculture that can affect water supplies. There are also many voluntary federal assistance programs that can assist states and localities to address highly susceptible source waters. Communication with all EPA programs and other federal agencies about the progress of source water assessments and their potential roles will be a primary role of EPA's Water Program.

a) Increase the use of source water geographical information system data by federal agencies such as EPA's Underground Storage Tank, Underground Injection Control, Superfund and Landfill Management Programs, the Forest Service, Bureau of Land Management, and Department of Defense to make informed decisions about land use management in source water protection areas.

In the past, there was little information on the location and threats to source water protection areas. Increased availability and accessibility to the state source water protection areas could support inclusion of source water provisions in more pollution prevention guidance, regulation, outreach, and education materials of EPA and federal programs.

The Office of Ground Water and Drinking Water will need to work with EPA's Office of Enforcement and Compliance Assistance as well as Program Offices to strengthen implementation of an array of regulatory programs such as UST, UIC and RCRA to protect drinking water sources. Specifically in the short term, EPA will implement Phase I/II of the Class V UIC regulations to protect ground water and surface water resources currently used and potentially used for drinking water, as well as prioritize Class I, II and III UIC regulatory efforts to maximize protection of susceptible source waters.

b) Maximize integration of source water protection areas or source water assessment results in future SDWA regulations. SDWA Regulations are starting to incorporate source water protection. The future Long-Term 2 Enhanced Surface Water Treatment Rule is the first national primary drinking water regulation that specifically lists source water protection programs as one of the potential methods for compliance. The ground water rule is another example of linking source water quality with the regulatory framework. As opportunities arise, EPA will promote source water contamination prevention by integrating source water considerations into future regulations as appropriate.

EPA Action Areas for Objective Four: Fostering Public Involvement

Source water assessments will guide decisions and actions to prevent contamination of the drinking water resource. This is based on the assumption that an interested public is ready for and receptive to the information that is being gathered. A lack of awareness will make the process of implementing preventative measures more difficult and slower.

a) Public education and outreach. Prior to completion of the source water assessments, EPA and other source water partners can increase the public's awareness about source water contamination prevention. Early education will increase the chance that, once the assessments are completed, the information will be used. EPA and other federal agencies can work with others to provide educational, informational, and promotional materials to initiate or enhance public involvement in local drinking water contamination prevention efforts.

b) Further promote source water information dissemination through Consumer Confidence Water Quality Reports. The first round of water quality reports was released in October 1999. EPA will follow up on a national public service announcement campaign to promote awareness of drinking water and include more information on the upcoming source water assessments and protection.

c) Develop media campaign guidance. EPA will work with stakeholders to develop guidelines on how to conduct local drinking water contamination prevention media campaigns.

EPA Action Areas for Objective Five: Increasing Private Industry Involvement

Private organizations can play a large role in promoting source water contamination prevention. Depending on the nature of the organization and its purpose, the role can range from increasing group members' awareness of contamination prevention efforts to providing technical assistance to communities or water suppliers. In many cases, simple changes in business practices can reduce the risk of contamination from a potential source managed by the business.

- a) Promote throughout the country initiatives to outreach to businesses and work more closely with other EPA offices that are developing voluntary performance standards for prevention of contamination of sources of drinking water – such as the Design for Environment Initiative (led by the Office of Pollution Prevention).*(Note: Expound on this approach.). These types of programs disseminate information to businesses on best management practices to prevent contamination of local water supplies.
- b) Collaborate with water supplier organizations to develop source water protection certification programs for water suppliers.*

PART III: MEASURING PROGRESS

The five objectives in this strategy outline a national approach to how to get to the vision that for every public water supply, all interested stakeholders will be involved in identifying priorities and taking actions that significantly lower the risk of contaminants of concern entering drinking water resources. However, in five years or ten, in the future, how will we be able to tell if the source water contamination prevention efforts making a difference for public health?

State and Tribal source water assessments and Clean Water Act assessments, coupled with information about local actions to protect drinking water sources, can help to answer this question. Potentially, there is a “suite” of information to collect:

- Trends in susceptibility of public water supplies relative to protection actions taken;
- Trends in the nature of potential contaminant threats of high concern in source water areas;
- Trends in ambient source water quality;
- Collecting information on the number of state source assessments completed: delineations, inventories, and susceptibility determinations made available to the public;
- Creating a national locational data layer of the state-defined source water protection areas; and
- Providing a reliable national picture of resources spent on source water across the country and resources needed.

National Data Management

This suite of information comes from a variety of sources – such as state source water programs, state clean water programs, and EPA 305(b) reports. The intent is to collect this information by the least burdensome and redundant means.

PART IV: EMERGING ISSUES

The following topics are starting to play more of a significant role in shaping the future directions of source water contamination prevention: 1) water quantity, 2) private water well protection, 3) research needs to support source water integration with the SDWA regulatory approach, and 4) state-tribal relationships. These issues need to be the subject of some significant analysis across the source water community as to what role does source water contamination prevention have in being part of the solution to these conflicts.

Water Quantity and a Comprehensive Watershed Approach

The Safe Drinking Water Act provides a framework for decreasing the risk to public health from polluted source waters. It deals very little with the issue of water supply and the impacts of dwindling supplies on community health and economies. This issue is left to state and regional authorities. At the local level, all of these issues merge: how not only to provide safe drinking water at the tap, but maintain a reliable flow.

Discussions of source water contamination prevention inevitably touch on water quantity. Quality often depends on quantity. Decreased recharge rates of aquifers and low flows in rivers can lead to increased salt concentrations, among other contaminants. Some stakeholders are asking that a national source water program address quantity issues. While this strategy does not directly address water quantity, as source water contamination prevention initiatives are implemented, all parties will need to be aware of issues of water storage, sequestration, conservation, and future use.

Protecting the Health of Private Well Owners

Approximately 42 million people in the U.S. obtain water from their own private drinking water supplies (U.S. Geological Survey, 1995). Most of these supplies are drawn from ground water through wells, but some households also use water from streams or cisterns. EPA does not oversee private wells, although some state and local governments set rules to protect users of these wells. Because the focus of the SDWA is on public water systems, it is difficult for EPA to develop national-level initiatives to assist private well owners to prevent contamination of their well water. However, there are other federal agencies that currently assist private well owners such as USDA's Rural Development Program, the Department of Housing and Urban Development and the Department of Health and Human Services. Additionally, some states and local governments currently regulate household drinking water systems. Seventeen states use voluntary certification programs for private water well examination licensing purposes.

EPA strongly encourages inclusion of private well owners and smaller public water systems in local source water protection efforts, and will target support for programs that provide a national framework for education of these groups.

SDWA Regulatory Framework and Source Water Research Needs

The SDWA authorizes the EPA to set national health-based standards to protect against both natural and anthropogenic contaminants that maybe found in drinking water. To regulate a contaminant, EPA must establish that 1) the contaminant may induce adverse health effects; 2) it is known or is likely to occur in public water supplies at levels of concern; and 3) in the Administrator's judgement, regulation presents a meaningful opportunity for health risk reduction. The 1996 Amendments emphasize the use of sound science in the regulatory decision making process. The 1996 Amendments also emphasize the importance of source water quality.

As knowledge about contaminant occurrence, fate and transport increase, what information is needed about the effects of source water contamination prevention management practices to make it scientifically defensible to include source water elements in the regulatory framework? The National Drinking Water Advisory Committee has convened a Research

Strategy Workgroup to identify research needs that will help shape new regulatory directions. Their discussions will include source water issues, and will be a step in addressing this topic.

Tribes and Source Water Protection

There are approximately 750 tribally-owned public water systems in the United States. EPA is committed to assisting all tribes interested in completing assessments and will continue to allocate resources for this purpose. There will be situations where mapping of source water protection areas by states or by tribes will cross state and tribal boundaries, and may identify contaminant sources of concern that are in a neighboring state or tribe's jurisdiction. In these cases the source water assessments can either be viewed as a seed for conflict, or as an opportunity for states and tribes to cooperatively protect the water resources. EPA and other federal agencies with responsibility in Indian Country, can act as mediators to facilitate effective source water protection efforts across jurisdictional boundaries.

CONCLUSION

As stated earlier, the responsibility for a successful transition from source water assessments to source water contamination prevention does not rest solely with the EPA or with federal programs. State agencies, trade groups, health and consumer advocates, environmentalists, land trusts and others have vital roles to play and can fill in critical gaps, particularly since this is a locally-based program. Also, in some cases, EPA's authority does not lend itself to dealing with a component of source water protection that may be very important at the local level, such as how to work with private well owners to lower source water contamination risks.

EPA's Water Program provides this strategy as a starting point and looks forward to implementing our key actions in concert with other partners over the next five years.

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